

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in light of the following discussion is respectfully requested.

Claims 1-22 remain active in this case.

In the outstanding Office Action, Claims 1-4, 8-11, and 16-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Specht et al. (USP 4,805,123, hereinafter called "Specht") in view of Jun et al. (USP 6,366,688, hereinafter called "Jun") and Tsai et al. (USP 4,845,558, hereinafter called "Tsai"); and Claims 19-22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Specht in view of Jun. However, Claims 5-7 and 12 were objected to as being dependent upon a rejected base claim, but were otherwise indicated as including allowable subject matter if rewritten in independent form.

Applicants acknowledge with appreciation the indication that Claims 5-7 and 12 include allowable subject matter. However, since Applicants consider that the pending independent claims patentably define over the cited references, Claims 5-7 and 12 are presently maintained in dependent form.

Applicants respectfully traverse the outstanding grounds for rejection based on the prior art, because in Applicants' view, independent Claims 1, 11 and 19 state features not disclosed or rendered obvious over the cited references.

In particular, pending Claim 1 recites:

1. A pattern inspection apparatus which performs die-to-die inspection of comparing detected pattern data of one area with detected pattern data of another area among a plurality of repeated pattern areas, comprising:
 - first imaging optics which forms first optical image of a pattern formed on an inspection target plate on the basis of design pattern data;
 - a detected pattern data generator which detects the first optical image and generates first detected pattern data;
 - second imaging optics which forms second optical image of the pattern, the second imaging optics serving to scan an entire region of the

pattern on the inspection target plate with an optical magnification lower than that of the first imaging optics;

a low-resolution image data generator which generates second detected pattern data corresponding to the entire region of the pattern on the inspection target plate by using the second optical image;

a repeated pattern area detector which detects the plurality of repeated pattern areas from the second detected pattern data; and

a comparator which sequentially compares the first detected pattern data corresponding to the plurality of repeated pattern areas detected by the repeated pattern area detector in accordance with die-to-die comparison.

Thus, it is seen that the invention defined by Claim 1 extracts repeated pattern areas from the whole inspection target plate by pattern matching or the like by means of the optical system with low magnification so as to increase efficiency of operations.

Specht detects misalignment between two dies by comparing a first stream of data having signal values representing the image content of each pixel thereof with a second stream of data having signal values representing the intended image content of the first stream of data. FIG. 1 of Specht shows two optical systems and comparison means.

The outstanding Office Action states the finding that Specht discloses a basic structure of the pattern inspection apparatus of Applicants' invention with the exception of means for detecting repeating patterns from the second imaging means. However, as recited in Specht's claim 29, the Specht inspection apparatus comprises means for generating first and second streams of data, memory means, detector means for detecting misalignment, alignment means for correcting misalignment, and detector means for comparing the aligned data and detecting differences.

In contrast, the invention recited in Claim 1 extracts repeated pattern areas from the whole inspection target plate by pattern matching or the like by means of the optical system with low magnification so as to increase efficiency of operations, as above noted. Applicants thus respectfully dispute the finding stated at page 3 of the outstanding Office Action that

Specht discloses second imaging optics, since the imaging optics of Specht has different functionality than that as claimed, insofar as the imaging optics of Specht are provided merely to acquire two die images in parallel (parallel acquisition of images in two portions), and are not used for detecting repeating patterns, as claimed. Thus, Specht does not disclose or suggest “a repeated pattern area detector” recited in Claim 1, and is therefore clearly deficient.

The outstanding Office Action relies on Jun as disclosing a repeated pattern area detector, citing Jun, FIG. 28, steps 520 and 524, and stating that the electron beam scans the entire region of the pattern, and therefore teaches the repeated pattern area detector recited in Claim 1. However, Jun detects failures of contact holes such as non-open contact holes by using the SEM by comparing electron signals detected from a unit area including at least one contact hole with the electron signal corresponding to a normal contact. Thus, Jun merely describes a region including contacts as a repeated area, and the inspection method merely detects failures by one-dimensionally scanning contacts.

On the other hand, the present invention detects repeated patterns by detecting two-dimensional patterns in the inspection target area by pattern matching or the like, as is evident from the further recitation in Claim 1 of “a comparator which sequentially compares the first detected pattern data corresponding to the plurality of repeated pattern areas detected by the repeated pattern area detector in accordance with die-to-die comparison.” Such a technology of detecting two-dimensional repeated patterns with subsequent die-to-die comparison, as recited in Claim 1, is not suggested by Jun. The outstanding Office Action states that Jun at column 20, lines 27-30 discloses detection of other repeated patterns; however, Jun provides no description or detailed explanations on the repeated patterns. Thus, it is respectfully

submitted that Jun does not cure the deficiencies in Specht, and that Claim 1 patentably defines over these references, whether considered alone or in combination.

The outstanding Office Action relies on Tsai as teaching optical systems having different magnifications. However, it is respectfully submitted that Tsai merely includes the isolated teaching of adjusting magnification by using a zoom lens. There is no motivation in the cited references to combine this teaching of Tsai with that of Specht that simply compares two equivalent dies, or that of Jun that detects failures by scanning one detector.

Accordingly, for the above-noted reasons, it is respectfully submitted that Claim 1 is in no way rendered obvious over the teachings of Specht, Jun and Thai, and that the outstanding rejection of Claim 1 is therefore traversed. Likewise, the outstanding rejection of Claims 10 and 19 is also traversed as these claims include the features found to be deficient in the cited references.

Accordingly, in view of the above comments, it is respectfully submitted that the outstanding grounds for rejection have been traversed. No further issues are believed to be outstanding, and the present application is believed to be in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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